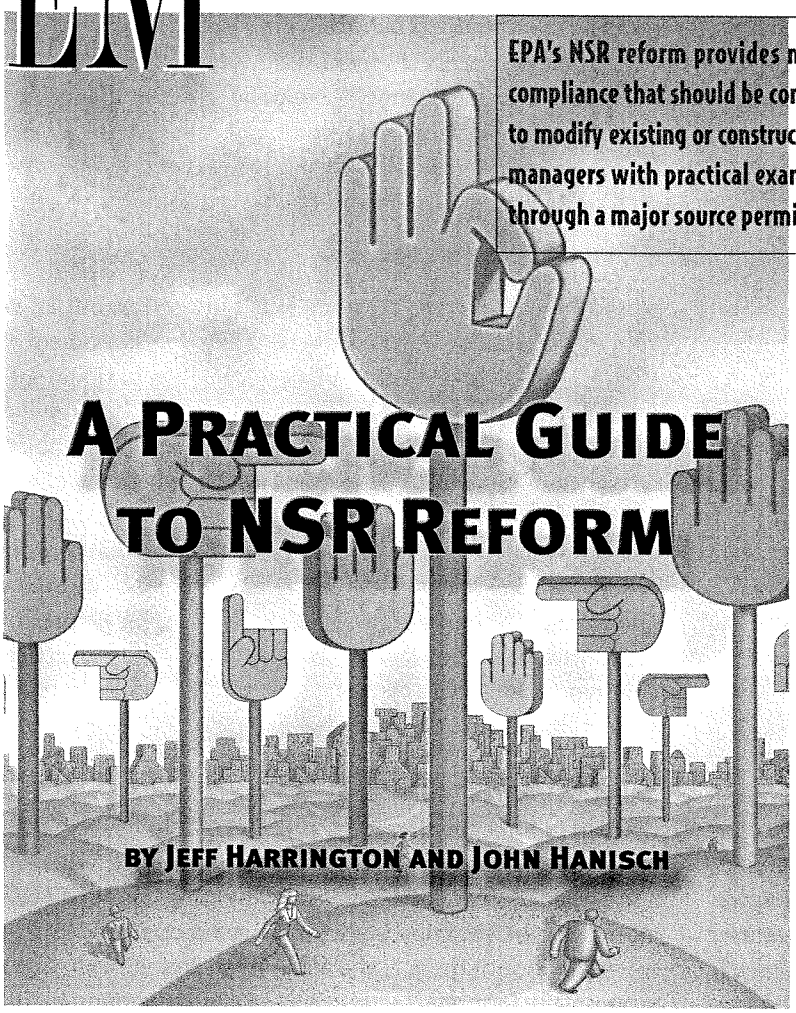

A Practical Guide to NSR Reform

BY JEFF HARRINGTON AND JOHN HANISCH

EPA's NSR reform provides major air emission sources with additional options for compliance that should be considered to maximize operating flexibility when planning to modify existing or construct new emissions units. This article provides environmental managers with practical examples of how these options could change the need to go through a major source permit modification.

As discussed in detail in the March 2003 issue of *EM*,[1] the U.S. Environmental Protection Agency (EPA) promulgated a series of reforms to its New Source Review (NSR) permitting program starting on December 31, 2002. These reforms are commonly referred to as "NSR reform." EPA asserts that the reforms reduce administrative burden, maximize operating flexibility, improve environmental quality, provide additional certainty, and promote administrative efficiency. Whether EPA's assertions are accurate has been the subject of considerable debate, but the agency arguably did not achieve one of its original goals of eliminating program complexity. In fact, the reforms did not eliminate anything substantive from the NSR program. Sources may continue to pursue NSR permitting strategies that were in effect before the reforms were promulgated. Nevertheless, the reforms do include additional options that sources should seriously consider to maximize operating flexibility. This article aims to provide major air emissions sources with a practical guide to developing NSR permitting strategies that take full advantage of the options now available.

The reforms promulgated to date primarily apply to existing sources proposing modifications. The NSR reforms promulgated on December 31, 2002,[2] addressed five major areas of the NSR permitting program: baseline actual emissions, actual-to-projected-actual applicability test, plantwide applicability limits (PALs), clean unit applicability test, and pollution control project (PCP) exclusion. EPA promulgated additional rules on November 7, 2003,[3] that were intended to clarify these initial NSR reforms. Included are example permitting scenarios that are intended to enhance comprehension of these major revisions to the NSR program.

BASELINE ACTUAL EMISSIONS

If you are an existing major emission source, determining if a modification to your facility is subject to the NSR permitting program has always required a calculation of past actual emissions from the facility, as well as a calculation of future emissions. The difference between the future emissions and the past actual emissions are compared to emission thresholds, which determine if the project must undergo NSR permitting. Simplistically speaking, an appropriate strategy to opt out of the NSR permitting program is to minimize the difference between future emissions and past actual emissions. This article discusses several new ways that the NSR reform can be used to minimize this difference. The first way is to use the maximum past actual emissions from the facility. Figure 1a provides an example past actual emissions profile that allows us to compare the methods allowed under NSR reform against the methods previously (and still) allowed. The example provides a 10-year history of actual sulfur dioxide (SO_2) emissions from an existing source. Actual emissions range from 425 tons per year (tpy) in 1996 to 650 tpy in both 1999 and 2001. Emissions variability, such as that shown, is likely to be normal for your process and may be reflective of product demand, facility outages, and other factors affecting your production and consequently your emissions. Note that we only selected SO_2 emissions for the sake of this example; a similar chart could be constructed for any of the criteria pollutants. As we will show in the following examples, if your emissions are variable, the NSR reforms will provide you with additional flexibility.

Prior to 1992, EPA required all sources to calculate past actual emissions by using the average of actual emissions from

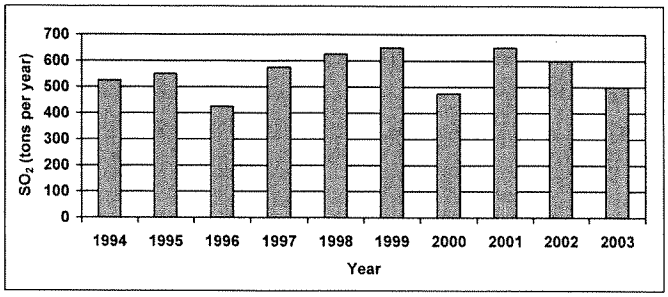

Figure 1a. Example past actual emissions for SO_2.

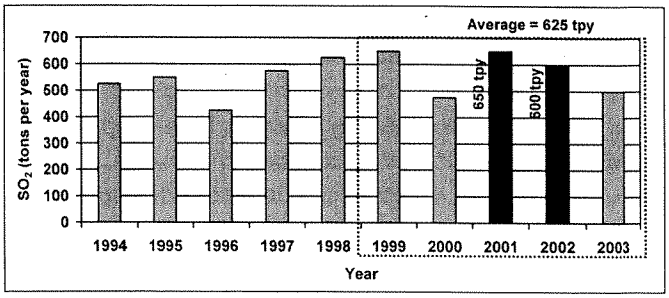

Figure 1c. Baseline actual emissions for SO_2 (EUSGU method).

the two calendar years immediately preceding the proposed modification (*note:* a source could use an alternative two-year period if justifiable and approved by the permitting authority). Figure 1b shows the emission profile presented in Figure 1a, but highlights the two-year period immediately preceding a proposed modification. The past actual emissions during 2002 and 2003 are 600 tpy and 500 tpy, respectively. Thus, the calculated past actual emissions are 550 tpy.

On July 21, 1992,[4] EPA promulgated the so-called "WEPCO rule," which included a new method for calculating past actual emissions that applied only to electric utility steam-generating units (EUSGUs). Non-EUSGU facilities were required to continue using the "original" method for calculating emissions. The EUSGU method allows a source to use any two-year period in the five years immediately preceding the proposed modification to calculate past actual emissions (*note:* a source could use an alternative two-year period if justifiable and approved by the permitting authority). Figure 1c again shows the emission profile presented in Figure 1a. A box is drawn around the five years preceding the proposed modification. Within this five-year period, the two-year period with the greatest actual emissions is 2001–2002 (650 tpy in 2001 and 600 tpy in 2002). Thus, the calculated past actual emissions are 625 tpy. The past actual emissions calculated under this EUSGU method is 75 tpy greater than those calculated under the "original" method. Clearly, the EUSGU method provides greater recognition of production variability in the calculation.

The NSR reforms provide a new method for calculating past actual emissions for non-EUSGUs. The non-EUSGU method allows a source to use any two-year period in the 10 years immediately preceding the proposed modification to calculate baseline actual emissions (*note:* a source cannot use an alternative two-year period in this case). Figure 1d shows the emission profile presented in Figure 1a. The two-year period within this 10-year period with the greatest actual emissions is 1998–1999 (625 tpy in 1998 and 650 tpy in 1999). Thus, the calculated baseline actual emissions are 637.5 tpy. The baseline actual emissions calculated under this non-EUSGU method is 87.5 tpy greater than those calculated under the "original" method. Clearly, the NSR reforms provide greater recognition of production variability in the calculation.

The examples presented in Figures 1b–1d show how NSR reform has affected the calculation of baseline actual emissions using calendar-year emissions. The NSR reform has now clearly identified that a facility can use any consecutive 24 months and not just two consecutive calendar years, as used in the examples above. This distinction is important because it again provides greater recognition of production variability. Figure 2 illustrates an example 36-month profile of volatile organic compound (VOC) emissions. As noted before, emissions variability such as that shown is likely to be normal for your process and may be reflective of product demand, facility outages, and other factors affecting your production and consequently your emissions. Boxes are drawn around two 24-month periods: one covers the calendar years 1999 and 2000 and the other covers the 24-month period with maximum actual emissions. Baseline actual emissions for calendar years 1999 and 2000 are 115.3 tpy. In contrast, baseline actual emissions for the 24-month period with maximum annual emissions are 117.8 tpy. The difference in this example is an additional 2.5 tpy for baseline actual emissions. Note that both non-EUSGUs and EUSGUs are allowed to calculate baseline

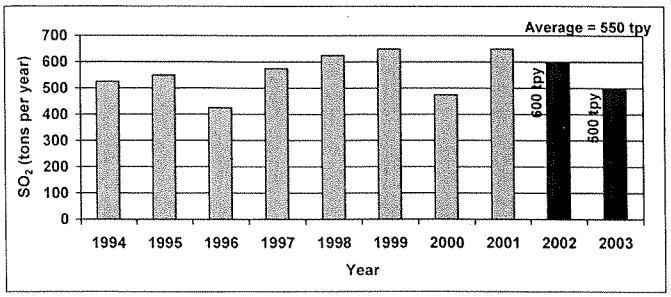

Figure 1b. Baseline actual emissions for SO_2 ("original" method).

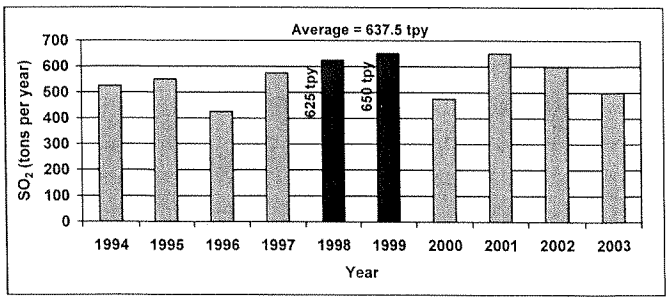

Figure 1d. Baseline actual emissions for SO_2 (non-EUSGU method).

actual emissions based on 24 consecutive months rather than two calendar years; however, EUSGUs can only look back five years, while non-EUSGUs can look back 10 years. Also note that you must have adequate verifiable data available to support your month-to-month calculation of emissions.

Another important consideration is that "baseline actual emissions" is a new term and it has a distinct definition from actual emissions. Baseline actual emissions are now used to assess applicability of the NSR permitting program, perform a netting analysis, and set a PAL emission limit. Actual emissions are calculated using the "original" method and must still be used to determine compliance with National Ambient Air Quality Standards (NAAQS) and Prevention of Significant Deterioration (PSD) increments, quantify impacts on air quality-related values (AQRVs), and calculate emission offsets. Consequently, projects subject to the NSR permitting provisions will need to calculate both baseline actual emissions and actual emissions.

The examples provided are intended to be simplistic and do not identify the number of emission sources included in the calculation of baseline actual emissions. If you have multiple emission sources, you must choose the same 24-month period for each emission source. The best way to approach this is to sum actual emissions from all of your emission sources for each month for a period of five years (EUSGUs) or 10 years (non-EUSGUs) to create a chart for the entire facility like that shown in Figure 2. Once this is done, you can then identify the 24-month period to be used in calculating baseline actual emissions.

The examples focus on single pollutants. If your project includes multiple pollutants subject to the NSR permitting requirements, note that each pollutant is evaluated independently of the other subject pollutants. Therefore, a 24-month period selected for nitrogen oxides (NO_x) does not have to be the same as a 24-month period selected for SO_2. Similarly, the examples do not address the details of a NSR netting analysis. If you are performing a netting analysis, each contemporaneous increase or decrease of emissions is calculated independently. Therefore, you may select different 24-month periods for each contemporaneous change.

Additionally, the examples provided above do not distinguish between "existing" and "new" emission units. This is perhaps one of the more confusing aspects of calculating baseline actual emissions because a "new" emission unit could actually be an existing unit. As discussed under the PAL example below, any existing units that are less than two years old will be subject to the "new" emission unit procedures. If you have such a unit that needs to be included in the baseline actual emissions calculation, consult the NSR rules as they prescribe the emissions to be assigned to these units. Finally, the examples do not elaborate on additional restrictions imposed by EPA. If you have legally enforceable emission limits (even those voluntarily imposed), you will not be allowed to use

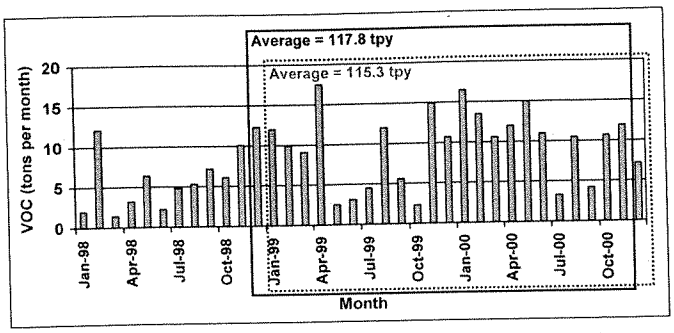

Figure 2. Baseline actual emissions for VOC (24 consecutive months comparison).

actual emissions in excess of those limitations. For example, if you have actual particulate matter (PM_{10}) emissions of 110 tpy, but you also have a permit condition that limits annual PM_{10} emissions to 100 tpy, you cannot use the 10 tpy that exceeded your permit limit. You must also calculate emissions based on the actual materials used at the time. For example, if you select a 24-month period when your multi-fuel turbine burned only natural gas, you cannot calculate emissions based on the equivalent heat input supplied by distillate oil just to derive a higher SO_2 emission rate. Note that you cannot calculate emissions based on actual materials used at the time if you are now prohibited from using the materials. For example, if you select a 24-month period when your multi-fuel turbine burned only distillate oil and you are now prohibited from burning distillate oil, you must calculate the emissions as though you had been burning natural gas at the time.

ACTUAL-TO-PROJECTED-ACTUAL APPLICABILITY TEST

The NSR permitting process historically required all emission sources to determine applicability of the NSR requirements by calculating the difference between future potential emissions and baseline actual emissions. The NSR reforms still allow all emission sources to use this approach (known as the "actual-to-potential" applicability test) and you may find it is still the best option for your project. EPA's 1992 WEPCO rule[5] provided an alternative applicability test to EUSGUs, which allowed emission sources to calculate the difference between future representative actual emissions and baseline actual emissions. The future representative actual emissions were based on two future years. The NSR reforms extended this concept, with some changes, to all emission sources. This approach (known as the "actual-to-projected-actual" applicability test) requires a source to estimate projected actual emissions for either the next five or 10 years, depending on the circumstances of the proposed project. While this approach undoubtedly is more likely to demonstrate that a project is not subject to NSR, it comes with a price. Sources choosing to use this test are subject to considerably greater monitoring, recordkeeping, and reporting requirements than those choosing to use the

actual-to-potential applicability test.

Once you have calculated the baseline actual emissions for your proposed project, you will need to choose which applicability test to incorporate into your permitting strategy. First, calculate your future potential emissions resulting from the proposed project. On one hand, if the difference between your future potential emissions and your baseline actual emissions is less than the NSR applicability threshold, then the actual-to-potential applicability test clearly demonstrates that your proposed project is not subject to the NSR permitting program. On the other hand, if the actual-to-potential applicability test indicates that the project may be subject to the NSR permitting requirements, you are advised to calculate projected actual emissions to conduct the actual-to-projected-actual applicability test and compare its outcome to that of the actual-to-potential test. Below are two simple examples that highlight the choices you will most likely confront.

Figure 3a shows baseline actual emissions of SO_2 calculated as 625 tpy. Projected actual and future potential emissions of SO_2 are calculated to be 700 tpy and 750 tpy, respectively. We first employ the actual-to-potential applicability test and find the difference between future potential emissions and baseline actual emissions to be 125 tpy (i.e., 750 – 625 = 125). The difference is greater than the 40-tpy NSR threshold for SO_2, so the actual-to-potential test indicates the project will be subject to NSR permitting. We next employ the actual-to-projected-actual applicability test and find the difference between projected actual emissions and baseline actual emissions to be 75 tpy (i.e., 700 – 625 = 75). Again, the difference is greater than the 40-tpy NSR threshold for SO_2. Therefore, both applicability tests indicate the project will be subject to NSR permitting. In this case, you should choose to use the actual-to-potential applicability test for your permitting strategy. However, if you are required to obtain offsets in the permitting process, your best choice may be the actual-to-projected-actual applicability test because it would minimize your allowable emissions and, therefore, the amount of offsets needed. The offset requirement would impose additional monitoring and recordkeeping requirements consistent with those of the actual-to-projected-actual applicability test, so there is little to lose by choosing it.

Figure 3b shows baseline actual emissions of SO_2 calculated as 625 tpy, as before; however, projected actual and future potential emissions of SO_2 are calculated to be 650 tpy and 750 tpy, respectively. As with the first example, we first employ the actual-to-potential applicability test and find the

difference between future potential emissions and baseline actual emissions to be 125 tpy (i.e., 750 – 625 = 125). The difference is greater than the 40-tpy NSR threshold for SO_2, so the actual-to-potential test indicates the project will be subject to NSR permitting. We next employ the actual-to-projected-actual applicability test and find the difference between projected actual emissions and baseline actual emissions to be 25 tpy (i.e., 650 – 625 = 25). In this case, the difference is less than the 40-tpy NSR threshold for SO_2. With this example, you may initially be inclined to permit the proposed project as a minor source and accept the additional monitoring, recordkeeping, and reporting requirements that come with the decision. Nevertheless, the additional burden required with the actual-to-projected-actual test should not be taken lightly. Some sources may actually prefer the NSR permitting process to the additional monitoring burden and choose to use the actual-to-potential applicability test. As in the first example, the need to obtain offsets may influence your decision in favor of the actual-to-projected-actual applicability test.

It should be noted that the rules allow an existing facility to adjust its calculated projected actual emissions to account for future projected demand growth. If there is a justifiable increase in product demand that is not the result of the proposed modifications, the resulting emissions increase can be included in the calculation of the projected actual emissions. An example of where this may be appropriate would be if a facility just won a new contract that will increase production and emissions on the existing equipment by 10%. However, after the modification is constructed the facility will need to demonstrate that the emission increase resulted solely from the existing operations, not the modifications.

In summary, calculate the results of both applicability tests if the actual-to-potential applicability test indicates your proposed project is subject to NSR. You will not be able to determine which approach is best for your proposed project if you do not calculate both. Carefully consider the need for offsets when making your decision and don't forget to include your contemporaneous increases and decreases if you are netting emissions. Finally, make sure you have included all demand growth emission increases when you calculate your projected actual emissions.

PLANTWIDE APPLICABILITY LIMITS

Plantwide applicability limits (PALs) are now officially an option in the NSR permitting process, although they have been available in various forms over the years.[6] A PAL effectively allows a source to make changes without going through major modification permitting, as long as plantwide emissions do not exceed a plantwide emission limit. A PAL can give a source tremendous permitting flexibility as long as future plans allow, so sources are wise to seriously consider the PAL option.

To illustrate the PAL option, we have chosen to elaborate on an example provided in EPA's preamble of the December 31, 2002, NSR reform rule.[7] Figure 4a graphically depicts the hypothetical facility. The source includes five emission units that emit VOCs. Total potential emissions are 620 tpy. Baseline actual emissions amount to 340 tpy, based on actual operations during the 24-month period from July 1, 1996, through June 30, 1998. EPA included the following complicating factors:

- Unit A is subject to a VOC Reasonably Available Control Technology (RACT) requirement that became effective in 2000;
- Unit D is permanently shutdown; and
- Unit E exists, but is less than two years old, so it is defined as a "new" unit for the purpose of calculating baseline actual emissions.

The hypothetical facility is located in a serious ozone nonattainment area, so the major source threshold is 50 tpy

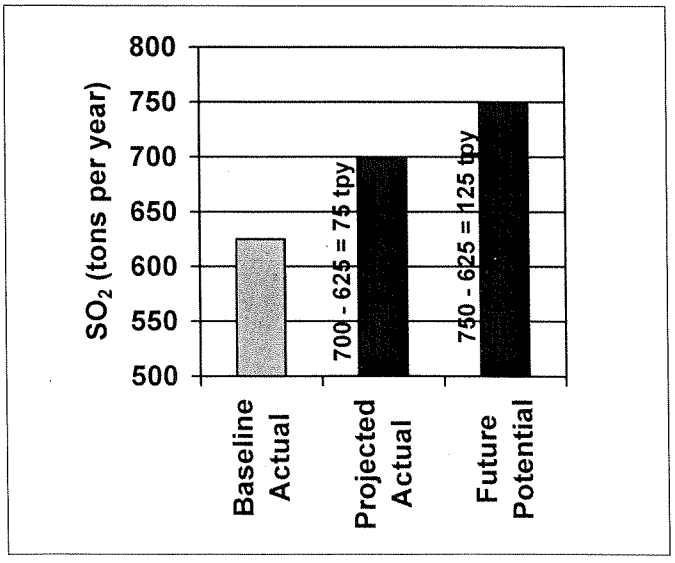

Figure 3a. Difference between applicability tests (Example 1).

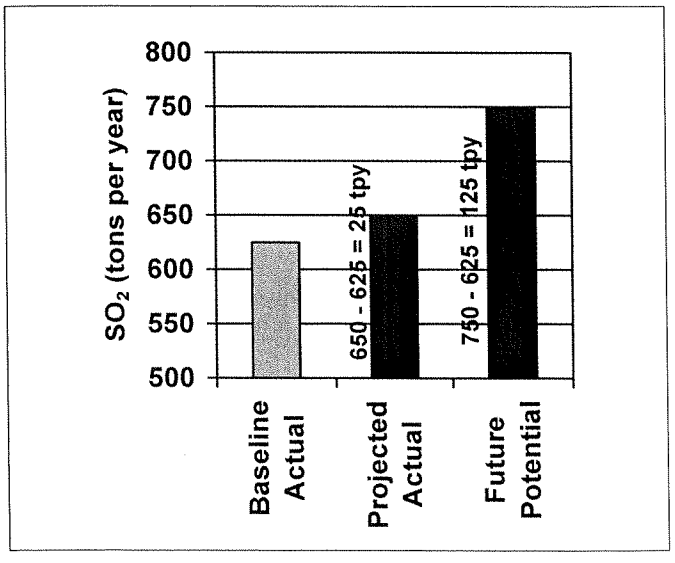

Figure 3b. Difference between applicability tests (Example 2).

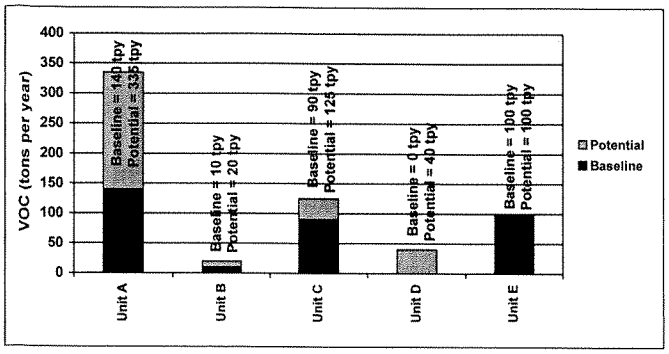

Figure 4a. VOC emissions from hypothetical facility (total baseline actual emissions are 340 tpy; total potential emissions are 620 tpy).

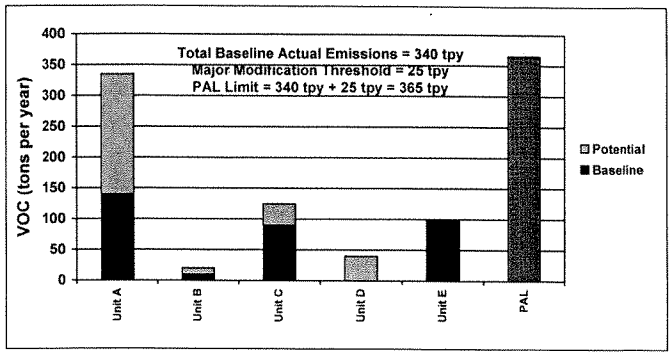

Figure 4b. The resulting PAL limit compared to individual units.

and the major modification threshold is 25 tpy. Units A, C, and E are each individually major sources by definition.

EPA has defined the PAL emission limit to equal the sum of the baseline actual emissions and the major modification threshold. For this example, therefore, the PAL emission limit would be 365 tpy (i.e., 340 + 25 = 365). Figure 4b presents the calculated PAL emission limit alongside the potential emissions and baseline actual emissions of the individual units. Assuming this facility chooses the PAL option, it can make modifications without going through the NSR process, as long as plantwide emissions remain less than 365 tpy (i.e., plantwide emissions do not increase more than 25 tpy above the baseline actual emissions of 340 tpy).

While the PAL option potentially provides tremendous permitting flexibility, there are situations where the PAL option is not in a facility's best interest. Sources are advised to think carefully about future changes that will affect emissions. If you can reasonably expect emissions to increase significantly over the next 10 years, the PAL option can result in a greater compliance burden than the traditional NSR approach. As an example, consider that the hypothetical facility modifies

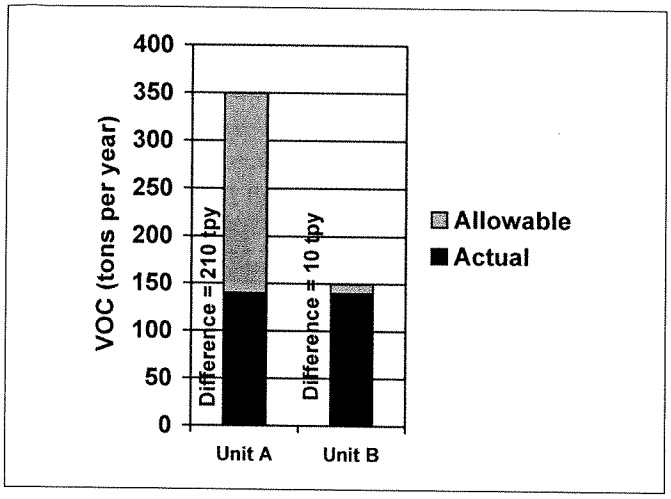

Figure 5. Example units evaluating clean unit status (Unit A has considerably more flexibility than Unit B).

Unit C in 2006, which results in a 24-tpy increase in emissions from that unit. Because the emissions increase is less than 25 tpy, the modification is not subject to NSR with or without a PAL. The hypothetical facility then modifies Unit E in 2008, which results in another 24-tpy increase in emissions from that unit. The 2008 modification is unrelated to the 2006 modification and EPA agrees that the modifications are unrelated (EPA agreement is a must). Without a PAL, the Unit E modification would not be subject to NSR. With the PAL, in contrast, any increase above 24 tpy triggers NSR. The source would either need to find emission reductions from other units to keep the increase below 24 tpy or be forced to go through the NSR process and apply to increase the PAL emission limit.

If you choose to obtain a PAL, you are still obligated to inform your permitting authority of your modifications even if they are not subject to NSR. This is required to demonstrate that your modifications remain in compliance with your PAL permit. Additionally, modifications made under your PAL could be subject to minor source permitting rules, which your permitting authority administers. If you have a minor source Best Available Control Technology (BACT) requirement, you may be required to perform a BACT analysis even though the PAL would not require such an analysis. Minor source BACT requirements will make the PAL option less attractive.

Other considerations are important. As seen in the example above, the calculation of baseline actual emissions is a key element of setting the PAL emission limit. The strategy discussed previously for maximizing baseline actual emissions applies here. PALs are pollutant-specific. For example, you may find it appropriate to obtain a PAL for your VOC emissions and use the traditional approach for NO_x emissions (or obtain separate PALs for each pollutant). PALs also require monitoring, recordkeeping, and reporting requirements that you may not otherwise be subject to. The final rule[8] and subsequent clarification[9] elaborate considerably on the PAL option, as does the article that appeared in the March 2003 issue of *EM*.[1] You are encouraged to review these sources to obtain further details.

CLEAN UNIT APPLICABILITY TEST

The "clean unit" option allows a source to make certain changes to designated emission units without triggering NSR permitting procedures. If you have an emission unit that is subject to the NSR BACT or Lowest Achievable Emission Rate (LAER) requirements, that emission unit automatically qualifies as a "clean unit," as long as a capital expenditure was required to comply with BACT or LAER. Note that emission units that have only been subject to minor source BACT or LAER do not automatically qualify. An existing unit that has not been through the NSR permitting process can also qualify, as long as the unit meets the following criteria: it employs a control technology that is comparable to BACT or LAER and a capital expenditure was made for it; it does not cause or contribute to violations of NAAQS or PSD increments; it does not adversely impact AQRVs; and it applies for the clean unit determination through a process that includes a public notice and an opportunity for public comment.

Should you pursue a clean unit determination? Figure 5 provides an example of two emission units that can qualify for clean unit status. Both units have actual VOC emissions of 140 tpy; Unit A has allowable emissions of 350 tpy and Unit B has allowable emissions of 150 tpy. Modifications to Unit A can be performed without triggering NSR, as long as future unit emissions are less than 350 tpy. In contrast, modifications to Unit B can be performed without triggering NSR, as long as future unit emissions are less than 150 tpy. Clearly, Unit B has considerably less flexibility with clean unit status than does Unit A, as it only has 10 tpy above existing actual emissions to work with. Changes that result in VOC emissions increases of less than 10 tpy would not be subject to NSR regardless of a unit's status, so the incentive for applying for clean unit status for Unit B is considerably diminished. In contrast, Unit A would clearly benefit from clean unit status.

POLLUTION CONTROL PROJECT EXCLUSION

The pollution control project (PCP) exclusion applies to control technologies that reduce emissions of a target pollutant, but also increase emissions of a collateral pollutant. Figure 6 provides an example where a thermal oxidizer is installed to reduce VOC emissions at a source located in a serious ozone nonattainment area. The thermal oxidizer reduces 500 tpy of VOC emissions by 95% to 25 tpy. However, the thermal oxidizer also increases NO_x emissions from 70 tpy to 100 tpy. The 30-tpy increase of NO_x is greater than the NSR threshold of 25 tpy. The PCP exclusion allows the source to increase NO_x emissions without going through the NSR permitting procedures for major modifications.

EUSGUs have been allowed to use a PCP exclusion since the WEPCO rule was promulgated in 1992.[10] Non-EUSGUs have been allowed to use a PCP exclusion on a case-by-case

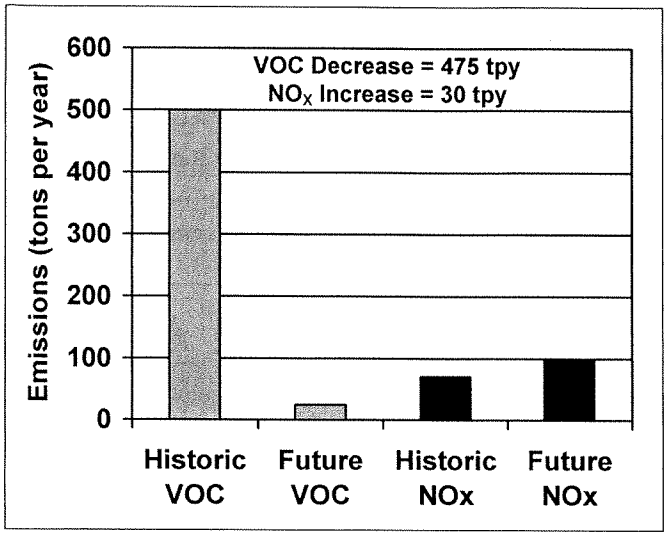

Figure 6. Example PCP exclusion candidate.

basis in accordance with EPA policy issued in 1994. The PCP exclusion provided in the NSR reforms supersedes both. The NSR reforms list certain projects that automatically qualify for the PCP exclusion. If a project does not appear on the list, projects can still be approved for the PCP exclusion on a case-by-case basis that requires the emission source to go through the permitting process. You must demonstrate that the project does not cause or contribute to violations of NAAQS or PSD increments and does not adversely impact AQRVs, even if the project is included on the presumptive list.

THE ROLE OF YOUR STATE OR LOCAL PERMITTING AGENCY

A discussion of the NSR reforms is not complete without addressing the role of your state or local permitting agency. Your permits are issued either by

- a state or local permitting agency implementing its own NSR permitting regulations under an EPA-approved state implementation plan (SIP),
- a state or local permitting agency that has been delegated by EPA to issue permits under EPA's regulations, or
- EPA issuing permits under its own regulations.

If your permits are issued by a state or local permitting agency that implements its own NSR permitting regulations under an EPA-approved SIP, the NSR reforms are irrelevant until EPA approves a SIP revision for your permitting authority. These states are required to submit SIP revisions to accommodate the NSR reforms by January 2, 2006. There are no deadlines imposed on EPA to approve submitted SIP revisions. Therefore, the NSR reforms will not likely be relevant for at least two more years for these permitting authorities. If your permits are issued under EPA's regulations either by EPA itself or through a delegation to your state or local permitting agency, the NSR reforms became applicable on March 3, 2003. Therefore, the NSR reforms are immediately available.

In either case, you still need to carefully consider state or local rules that will impact your permitting strategy. For example, some states require applicants to perform BACT analyses for minor sources. Minor source BACT rules can diminish the attractiveness of the PAL option because modifications under the PAL would be required to evaluate BACT despite the federal exemption. Minor source BACT rules can also confound the clean unit exemption option—sources subject to minor source BACT do not automatically qualify for the exemption even if a capital expenditure was required. Other state rules can affect your strategy in similar ways.

CONCLUSION

EPA's NSR reform provides major air emission sources with additional options that should be considered to maximize operating flexibility when planning to modify or construct emission sources. We hope the practical examples provided in this article help demonstrate the importance of carefully planning your permitting strategy when considering modifications. Permitting scenarios will often be more complex than those presented here. We recommend that you perform a thorough evaluation of all emission units at your facility, and of your state and local rules, before finalizing your strategy.

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About the Authors

Jeffrey R. Harrington, P.E., is a senior project engineer with Earth Tech, located in the firm's South Portland, ME, office. He has 15 years of experience in air emissions permitting, air quality dispersion modeling, air emissions inventories, air toxics evaluations, compliance evaluations and assistance, ambient air quality and meteorological monitoring, model development, and applied statistics. Harrington is a member of A&WMA. He can be reached via e-mail at *jharrington@stanfordalumni.org.* **John L. Hanisch** is national air quality director for ARCADIS-US and works in the company's Lowell, MA, office. He has 30 years of experience in air quality issues. Recently, he has been involved in air issues related to power plant siting and licensing, asset acquisitions, strategic environmental management, facility-wide emissions inventories, and Title V operating permits. Previously, Hanisch served three years as air branch chief and six years as planning section chief for EPA's Air Management Division in Boston, where he was responsible for managing the federal air programs for all six New England states. Hanisch is a Fellow Member of A&WMA. He can be reached at via e-mail *jhanisch@arcadis-us.com.*